Predicting preference from attention: An analysis with prospect theory

Thorsten Pachur

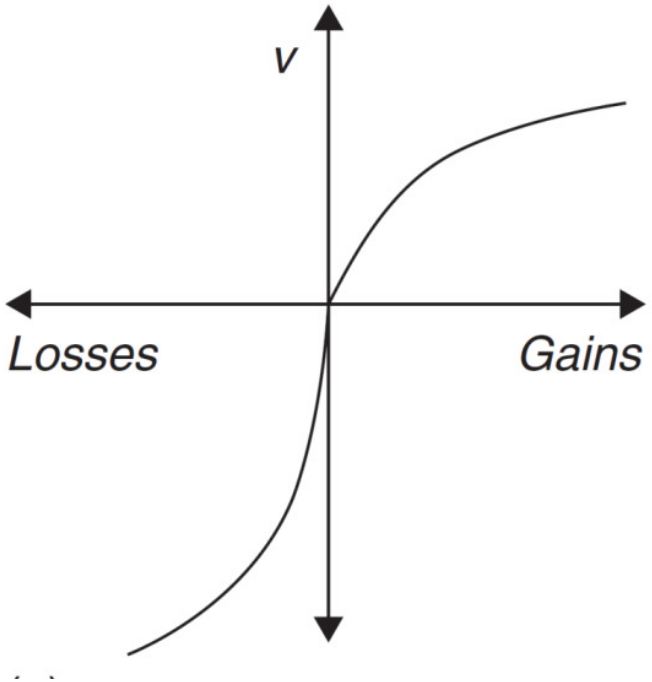
Max Planck Institute for Human Development, Berlin

ARC Center for Adaptive Rationality
Max Planck Institute
for Human Development

Cumulative prospect theory (CPT)

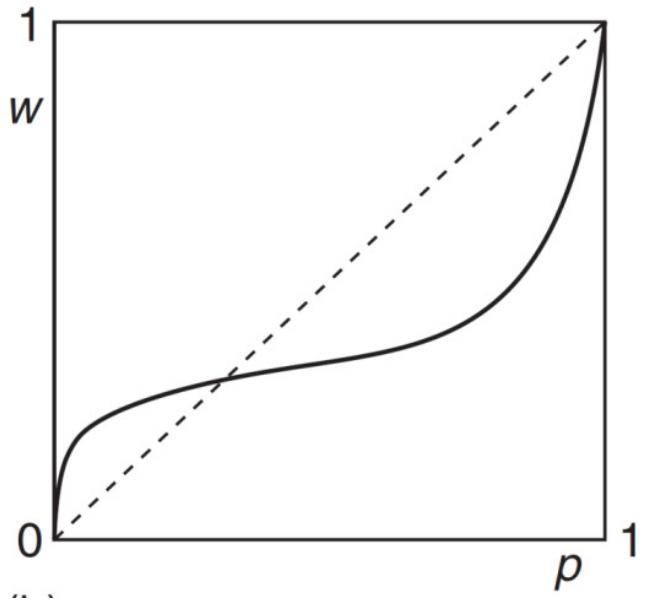
Value function

$$v(x) = x^{\alpha} \qquad x \geq 0$$
$$v(x) = -\lambda(-x)^{\alpha} \qquad x < 0$$



Probability weighting function

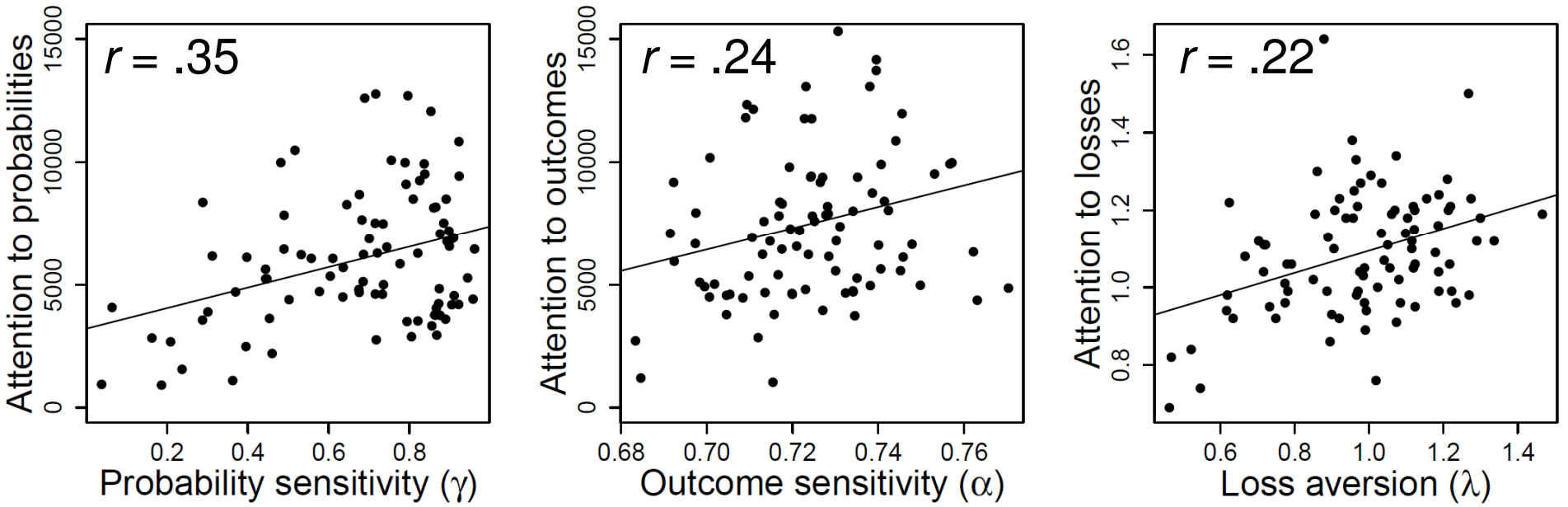
$$w(p) = \frac{\delta p^{\gamma}}{\delta p^{\gamma} + (1-p)^{\gamma}}$$



Tversky & Kahneman (1992)

CPT parameters track attention

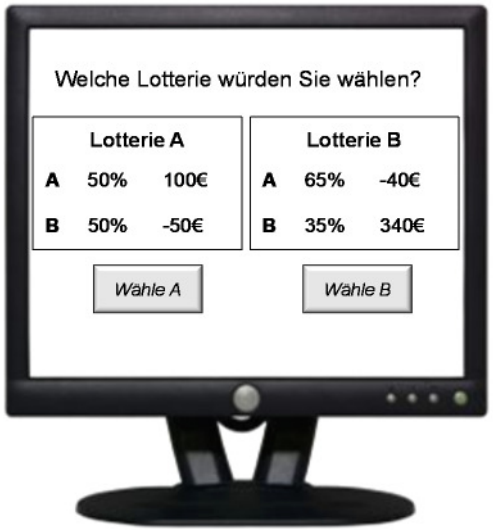
Mouselab



CPT

Pachur, Schulte-Mecklenbeck, Murphy, & Hertwig (2018)

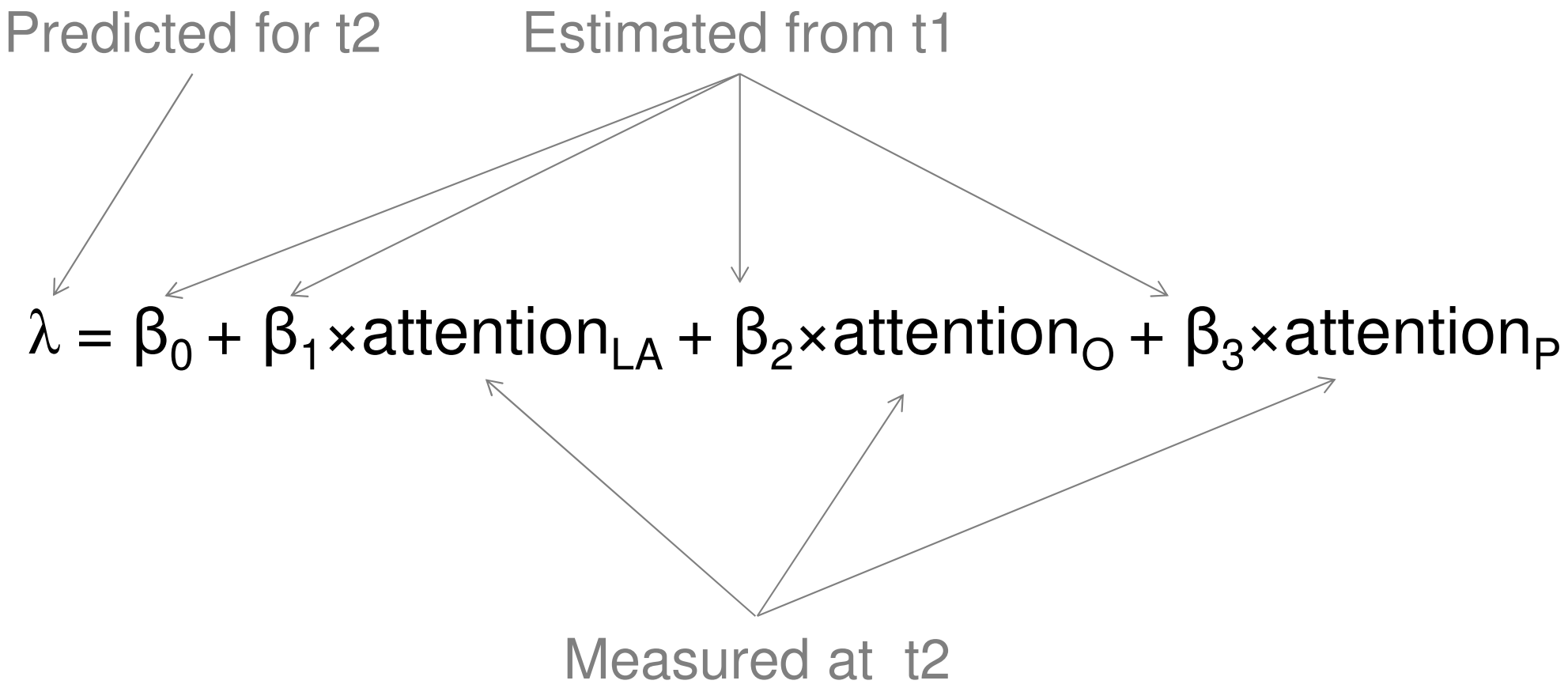
Session 1
(t1)



Session 2
(t2)

Pachur, Schulte-Mecklenbeck, Murphy, & Hertwig (2018)

Predicting choices using CPT with parameters predicted based on attention



Predicting choices using CPT with parameters predicted based on attention

$\lambda = \text{attention}_{LA} + \text{attention}_{O} + \text{attention}_{P}$

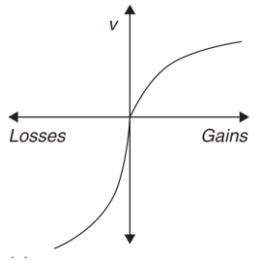
$\alpha = \text{attention}_{LA} + \text{attention}_{O} + \text{attention}_{P}$

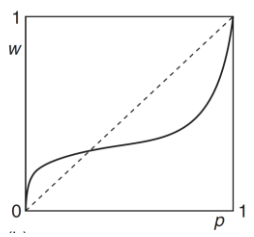
$\gamma = \text{attention}_{LA} + \text{attention}_{O} + \text{attention}_{P}$

$\delta^{+} = \text{attention}_{LA} + \text{attention}_{O} + \text{attention}_{P}$

$\delta^{-} = \text{attention}_{LA} + \text{attention}_{O} + \text{attention}_{P}$

$\varphi = \text{attention}_{LA} + \text{attention}_{O} + \text{attention}_{P}$



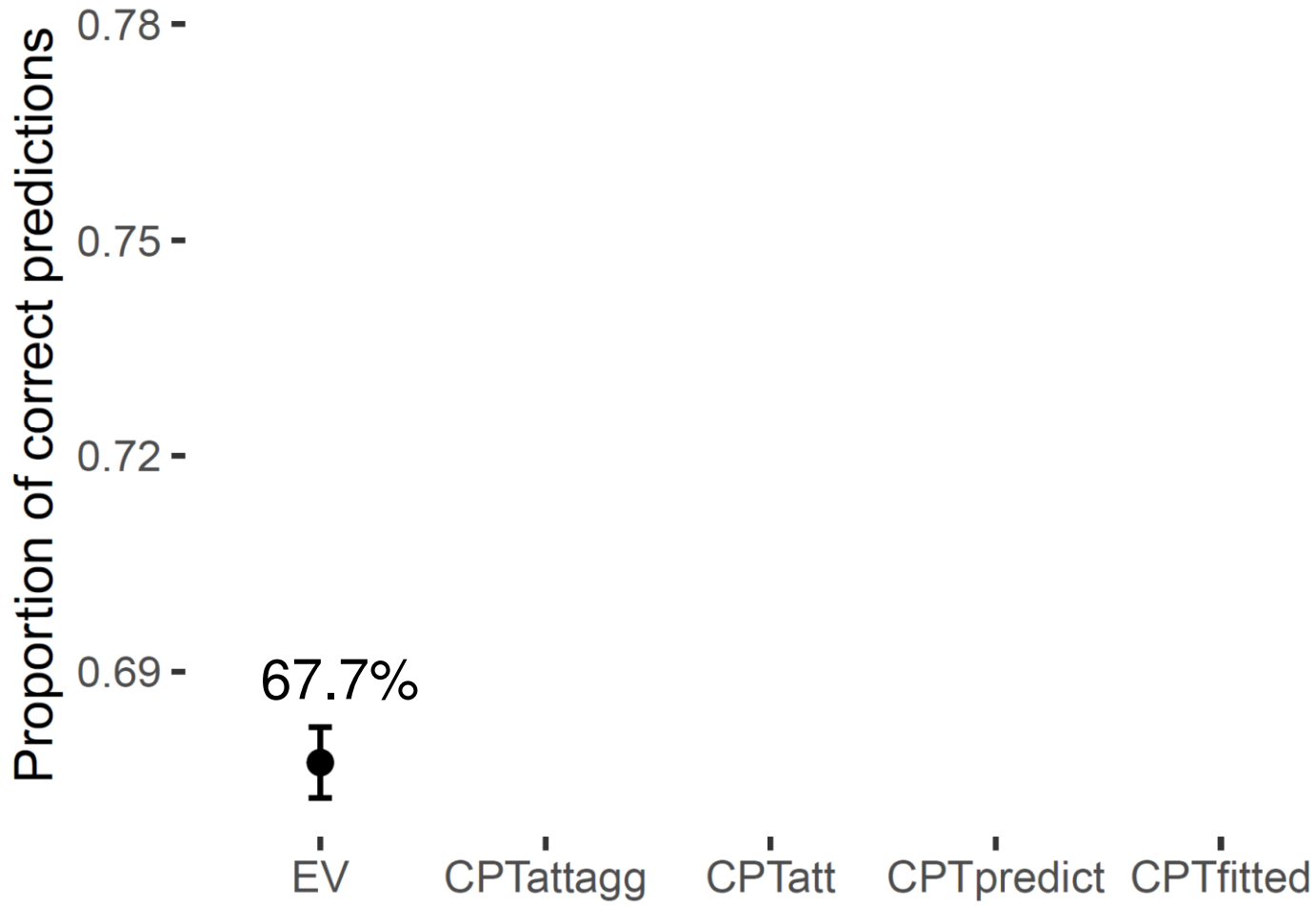


$$p(A,B) = \frac{e^{\varphi V(A)}}{e^{\varphi V(A)} + e^{\varphi V(B)}}$$

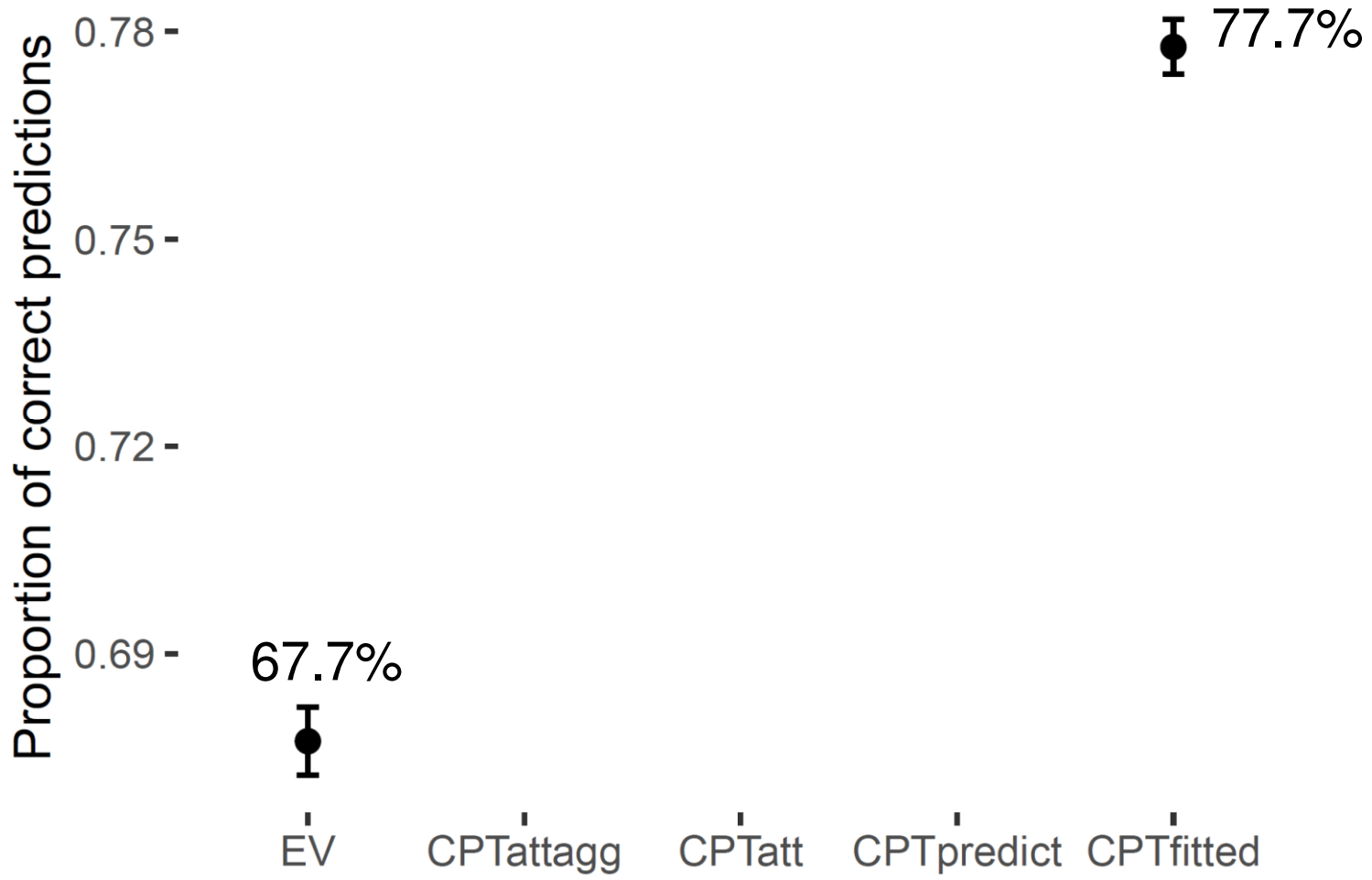
→ Predicted parameters used to derive choices across sessions for each participant

Predictive accuracy

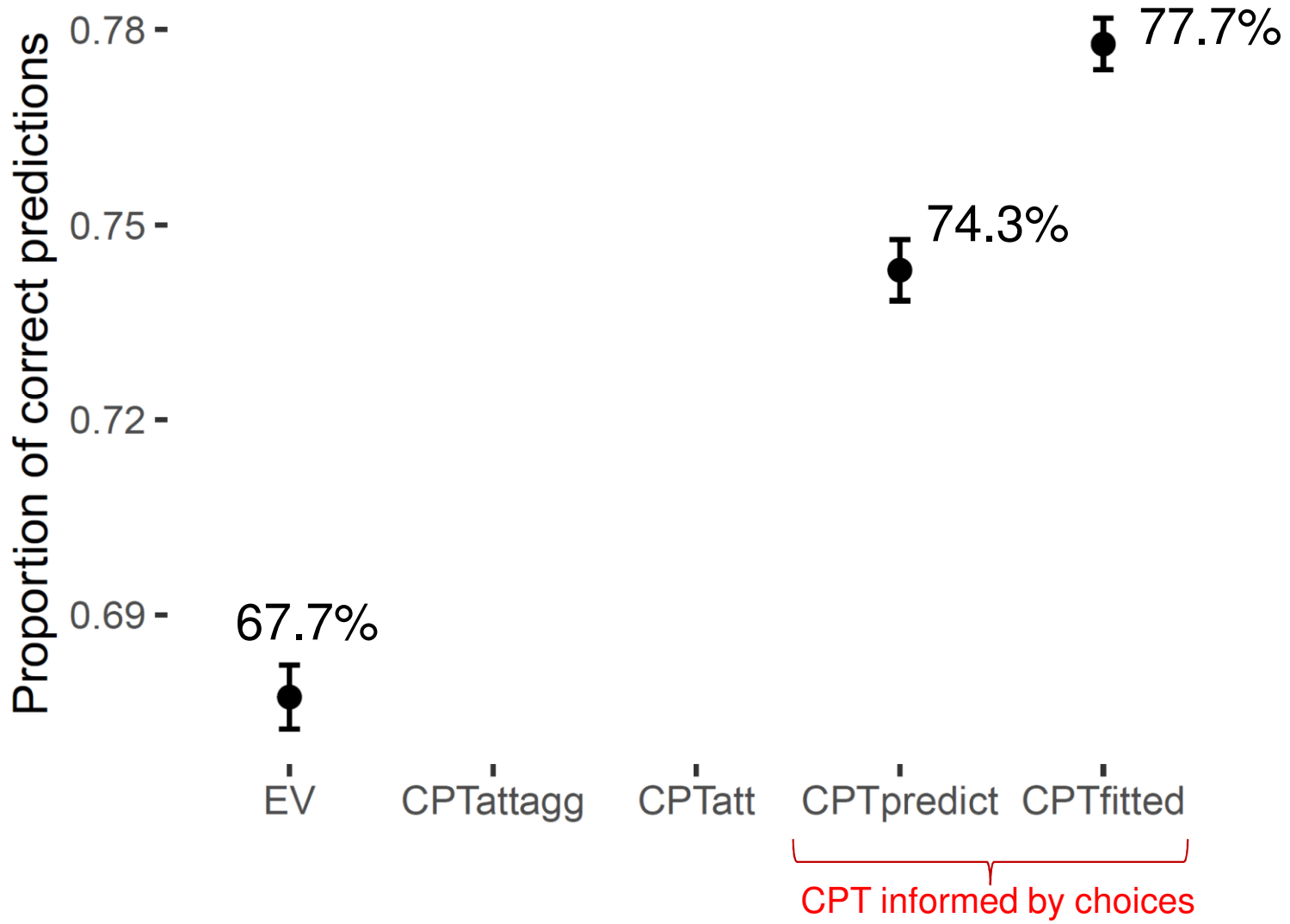
Predictive accuracy



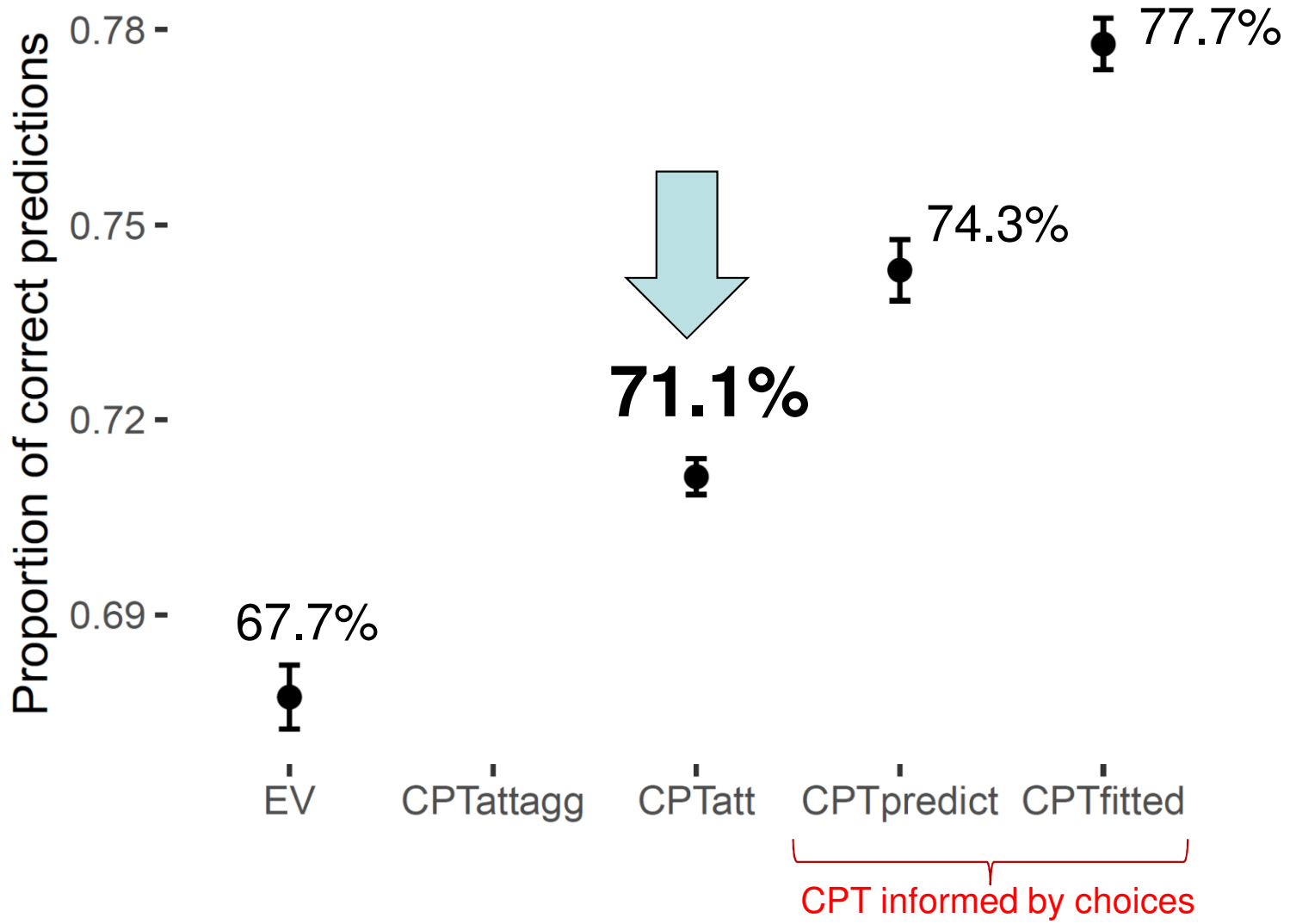
Predictive accuracy



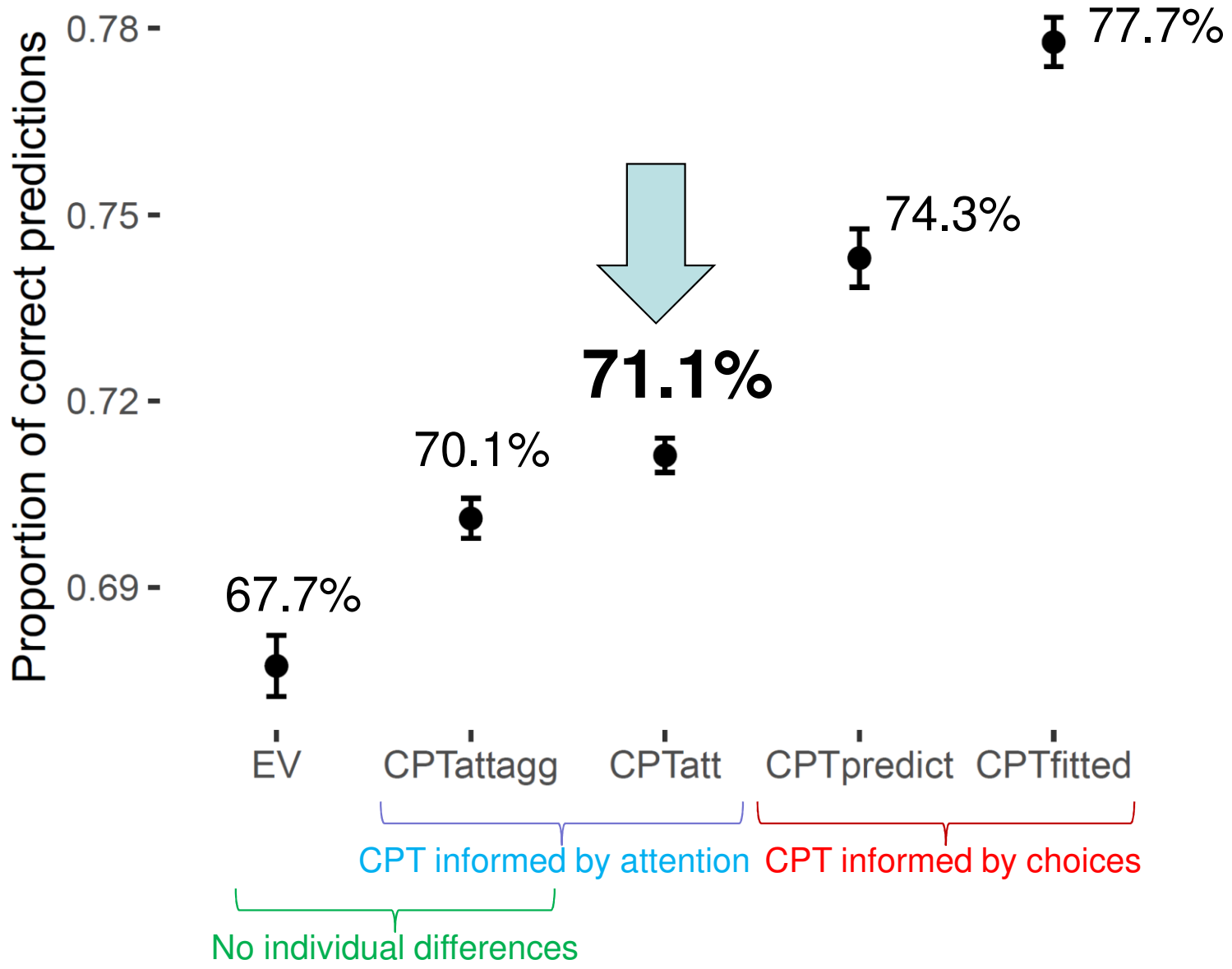
Predictive accuracy



Predictive accuracy



Predictive accuracy



Predicting preference from attention: An analysis with prospect theory

Thorsten Pachur

Max Planck Institute for Human Development, Berlin

ARC Center for Adaptive Rationality
Max Planck Institute
for Human Development